

**REMARKS**

The Final Office Action mailed March 12, 2007, has been received and reviewed, as well as the Advisory Action mailed May 18, 2007 (“the Advisory Action”). Claims 1 through 9, 11 through 74, 179 through 186 and 189 through 193 are currently pending in the application. Claims 1 through 9, 11 through 74, 190 and 192 are allowed. Claims 179 through 186, 189, 191 and 193 stand rejected.

Applicants have amended claims 1, 8, 35, 45, 65, 69, 179, 180, 181, 189, 190, 191, 192, and 193. Applicants respectfully request reconsideration of the application as amended herein.

**35 U.S.C. § 102 Anticipation Rejections**

**Anticipation Rejection Based on Paper No. WOCD-0306-05 to McKay et al. (Paper No. 1) and Paper No. WOCD-0306-02 to Galloway (Paper No. 2)**

Claims 179 and 191 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Paper No. WOCD-0306-05 to McKay et al. (Paper No. 1) and Paper No. WOCD-0306-02 to Galloway (Paper No. 2). Applicants respectfully traverse this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Regarding claim 179, Applicants do not agree with the Examiner’s assertion that cutting element “pockets” comprise “discrete cutting element retention structures,” as recited in claim 179. The as-filed specification for the present invention describes discrete cutting element retention structures at, for example, Paragraphs [00223]-[00224]. Applicants acknowledge the Examiner’s duty to give the claims the broadest reasonable interpretation consistent with the specification as it would be interpreted by one of ordinary skill in the art. M.P.E.P. § 2111. Applicants respectfully assert, however, that the Examiner’s apparent interpretation of the term “discrete cutting element retention structure” is not consistent with the specification as it would be interpreted by one of ordinary skill in the art.

Nonetheless, in an effort to expedite allowance of the claims, Applicants propose to further amend claim 179 to recite that the discrete cutting element retention structures extend from the nose portion, as opposed to merely being disposed on the nose portion, to further distinguish claim 179 over the cited prior art references.

Applicants respectfully assert that neither Paper No. 1 nor Paper No. 2 describes a casing bit that includes “a nose portion...; [and] a plurality of discrete cutting element retention structures extending from the nose portion, each discrete cutting element retention structure being configured to carry a sole cutting element,” as recited in independent claim 179. Paper No. 1 and Paper No. 2 each describe a casing bit that includes radially extending blades. The blades however, are configured to carry a plurality of cutting structures. Furthermore, the pockets formed in the blades do not extend from the nose portion. Neither Paper No. 1 nor Paper No. 2 describes a plurality of structures that extend from a nose portion of a casing bit and that are configured to carry a sole cutting element, as recited in independent claim 179. As neither Paper No. 1 nor Paper No. 2 describes each and every element set forth in claim 179, Applicants assert that claim 179 is not anticipated by either Paper No. 1 or Paper No. 2 and respectfully request that the Examiner withdraw the rejection of independent claim 179 under 35 U.S.C. § 102(a).

Regarding claim 191, Applicants respectfully assert that independent claim 191 is not anticipated by either Paper No. 1 or Paper No. 2 under 35 U.S.C. § 102(a) because neither Paper No. 1 nor Paper No. 2 describes a casing bit that includes “at least one groove formed in at least one blade of [a] plurality of blades, the at least one groove configured to cause the at least one blade of the plurality of blades in which the at least one groove is formed to separate into two or more smaller sections when another drilling tool is used to drill through the casing bit,” as recited in independent claim 191 as currently amended. The Examiner has asserted at Pages 3 and 7-8 of the outstanding Office Action that grooves shown “behind and between the cutting elements on the blades” in Figures 2 and 3 of Paper No. 1, as well as Figures 3 and 4 of Paper No. 2, would inherently cause “the bit face” (Page 3 of the outstanding Office Action), or “at least a portion of the casing bit” (Pages 7-8), to break or fail into sections when the next drill bit drills through the first bit. Even assuming, *arguendo*, that this is true, Applicants respectfully assert that neither Paper No. 1 nor Paper No. 2 describes a groove in a blade of a casing bit that is configured to cause

the blade to separate into two or more sections when the casing bit is drilled through using another drilling tool. As shown in Figures. 9 and 12 of Paper No. 1, the blades remain fully intact (although bent) after the bit has been displaced — note the blade has 13 cutters prior to being displaced and 13 cutters after being displaced. Thus, the grooves shown in the figures of Paper No. 1 clearly do not inherently cause the blades to break into sections when being drilled through by the subsequent drilling tool.

As neither Paper No. 1 nor Paper No. 2 describes each and every element set forth in claim 191, Applicants assert that claim 191 is not anticipated by either Paper No. 1 or Paper No. 2 and respectfully request that the Examiner withdraw the rejection of independent claim 191 under 35 U.S.C. § 102(a).

Anticipation Rejection Based on U.S. Patent No. 6,062,326 to Strong et al.

Claims 179 through 186 and 189 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Strong et al. (U.S. Patent No. 6,062,326). Applicants respectfully traverse this rejection, as hereinafter set forth.

Regarding claim 179, Applicants respectfully assert that Strong et al. does not describe a casing bit that includes “a nose portion...; [and] a plurality of discrete cutting element retention structures extending from the nose portion, each discrete cutting element retention structure being configured to carry a sole cutting element,” as recited in independent claim 179. Strong et al. describes, with reference to Figure 3, polycrystalline diamond compact (PDC) elements 48 that are set into the lateral edges of linear flutes 42 on a casing shoe. The pockets formed in the flutes 42 do not extend from a nose portion of the casing shoe. Furthermore, the flutes 42 are not configured to carry a sole PDC element 48. Strong et al. does not describe any other plurality of structures that extend from a nose portion of the casing shoe and that are configured to carry a sole cutting element, as recited in independent claim 179. As Strong et al. does not describe each and every element set forth in claim 179, Applicants assert that claim 179 is not anticipated by Strong et al. and respectfully request that the Examiner withdraw the rejection of independent claim 179 under 35 U.S.C. § 102(b).

Regarding independent claim 180, Applicants propose to amend claim 180 to recite that the casing section is a “separate” casing section of “a casing string.” While Figures 3 and 4 of Strong et al. illustrate a casing shoe 30 that comprises a “generally cylindrical steel casing 32,” the casing 32 is not a separate casing section of a casing string, as recited in claim 180. While the shoe 30 has a box portion 34 at its tail end “for connection to a casing string (not shown),” Strong et al. expressly notes that the casing string is not shown in Figures 3 and 4. Applicants respectfully assert that one of ordinary skill in the art clearly would not interpret the recitation of a “casing section of a casing string” as encompassing the steel casing 32 of the casing shoe 30 described by Strong et al. The only casing section of a casing string shown in the figures of Strong et al. is the portion of the casing string 20 shown in Figure 2. *Strong et al.*, column 1, lines 56-59.

Applicants assert that independent claim 180 is not anticipated by Strong et al. under 35 U.S.C. § 102(b) because Strong et al. does not describe a casing bit that includes “threads for securing the casing bit to a separate casing section of a casing string,” and “at least one gage section extending longitudinally from adjacent the nose portion, the at least one gage section configured to extend longitudinally adjacent at least a portion of the separate casing section of the casing string when the separate casing section is secured to the casing bit,” as recited in independent claim 180 as amended.

As previously discussed, Strong et al. describes a casing shoe 30 that includes a casing 32 having an internally threaded box portion 34 at its tail end, for connection to a casing string. *Strong et al.*, column 3, lines 40-42. The forward end of the casing 32 includes a generally rounded nose portion 36. The threaded box portion 34 is not, and does not include, a gage section configured to define an outermost radius of the casing bit 10. Applicants respectfully assert that if the entire casing shoe 30 is considered to be a “casing bit,” as recited in claim 180, the elements of the casing shoe 30 do not correspond to the elements recited in claim 180 because the casing shoe 30 does not include at least one gage section configured to extend longitudinally adjacent at least a portion of a separate casing section of a casing string when the separate casing section is secured to the casing bit. The gage sections 46 of the flutes 42 would not extend longitudinally adjacent to another casing section of a casing string when the casing

shoe 30 is attached to that casing section using the threaded box portion 34. If, however, only the generally rounded nose portion 36 of the casing shoe 30 is considered to be a “casing bit,” as recited in claim 180, the elements of the casing shoe 30 still do not correspond to the elements recited in claim 180 because the generally rounded nose portion 36 does not include at least one thread for securing the rounded nose portion 36 to the casing 32.

In view of the above, Strong et al. clearly does not describe a casing bit that includes each and every element recited in claim 180. As Strong et al. does not describe each and every element set forth in claim 180, Applicants assert that claim 180 is not anticipated by Strong et al. and respectfully request that the Examiner withdraw the rejection of independent claim 180 under 35 U.S.C. § 102(b).

Applicants additionally assert that each of dependent claims 181-186 is allowable at least because each depends from claim 180, which is allowable. Therefore, Applicants assert that these claims are not anticipated by Strong et al. and respectfully request that the Examiner withdraw the rejection of these dependent claims under 35 U.S.C. § 102(b).

Regarding independent claim 189, Applicants respectfully assert that independent claim 189 is not anticipated by Strong et al. because Strong et al. does not describe a casing bit that includes “... at least one cutting element...comprising a polycrystalline diamond cutting element...positioned in rotational alignment with...at least one cutting element...comprising a tungsten carbide cutting element, the at least one cutting element [comprising a polycrystalline diamond cutting element] positioned to rotationally follow the at least one cutting element [comprising a tungsten carbide cutting element] when the casing bit is rotated during a drilling operation,” as recited in independent claim 189 as presently amended.

Strong et al. describes, with reference to Figure 4 thereof, primary cutting structures that include polycrystalline diamond compact (PDC) elements 48. Strong et al., column 3, line 65 – column 4, line 4. “The PDC’s 48 are located along the tapered forward portions of the flutes 42.” *Id.*, column 4, lines 8-9. Furthermore, “[t]he rearward portions 46 of the flutes 42 extending along the sides of the casing 32 are configured as stabilizing pads and may be provided with hard facings of material such as tungsten carbide, and “[t]he trailing ends of the flutes 46 may also be provided

with abrasive elements 49 of material such as aggressive tungsten carbide.” *Id.*, column 4, lines 9-14.

Strong et al. also describes secondary cutting structures 44, “incorporated in the rounded nose 36 and intended primarily for the displacement of unconsolidated materials.” *Strong et al.*, column 3, lines 61-64. As described by Strong et al., “[d]epending upon the type of obstructions expected to be encountered by the secondary cutting structures 44, cutting elements (not shown) such as tungsten carbide discs...might be incorporated therein....” *Strong et al.*, column 4, lines 26-30.

The Examiner appears to assert at Page 4 of the outstanding Office Action that claim 189 reads on the cutting elements 44 of the secondary cutting structures and the cutting elements 48 of the primary cutting structures. Applicants respectfully disagree at least because the cutting elements 44 and the cutting elements 48 are not in “rotational alignment” with one another, as required by claim 189. The Examiner asserts at Page 4 of the outstanding Office Action that the cutting elements 44 and the cutting elements 48 are in rotational alignment “since they are on the same blade together.” Although cutting elements on the same blade may, in some instances, be in rotational alignment, all cutters on the same blade clearly are not inherently in rotational alignment. Rotationally aligned cutting elements 384 and 386 are described at, for example, Paragraphs [00157] – [00159] of the as-filed specification of the present application with reference to Figure 10B (see the last two sentences of Paragraph [00159]). At best, the cutting elements 44 and the cutting elements 48 might be in longitudinal alignment (although Strong et al. does not describe the cutting elements 44 and the cutting elements 48 in any sort of alignment), but they are clearly not in rotational alignment. During rotation of the drill bit described by Strong et al., the cutting elements 44 would not “rotationally follow the cutting elements 48, and the cutting elements 48 would not “rotationally follow” the cutting elements 44. Therefore, Applicants respectfully assert that one of ordinary skill in the art clearly would not interpret the recitation of “... at least one cutting element...comprising a polycrystalline diamond cutting element...positioned in rotational alignment with...at least one cutting element...comprising a tungsten carbide cutting element, the at least one cutting element [comprising a polycrystalline diamond cutting element] positioned to rotationally follow the at least one cutting element [comprising a tungsten carbide

cutting element] when the casing bit is rotated during a drilling operation,” as reading on the cutting elements 44 of the secondary cutting structures and the cutting elements 48 of the primary cutting structures described by Strong et al. Therefore, Strong et al. clearly does not describe a polycrystalline diamond cutting element positioned in rotational alignment with a tungsten carbide cutting element.

As Strong et al. does not describe each and every element set forth in claim 189, Applicants assert that claim 189 is not anticipated by Strong et al. and respectfully request that the Examiner withdraw the rejection of independent claim 189 under 35 U.S.C. § 102(a).

### **35 U.S.C. § 103(a) Obviousness Rejections**

Obviousness Rejection Based on Paper No. WOCD-0306-05 to McKay et al. (Paper No. 1) or U.S. Patent No. 6,062,326 to Strong et al. in view of U.S. Patent No. 2,215,913 to Brown

Claim 193 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Paper No. WOCD-0306-05 to McKay et al. (Paper No. 1) or Strong et al (U.S. Patent No. 6,062,326) in view of Brown (U.S. Patent No. 2,215,913). Applicants respectfully traverse this rejection, as hereinafter set forth.

Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727 (2007) (citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966)).

Applicants respectfully assert Paper No. 1, Strong et al., and Brown, when combined, do not describe, teach, or suggest a drilling assembly comprising “at least one of an incendiary agent, an explosive agent, and a reactive chemical in a container affixed to at least one of the casing section and the casing bit,” as recited in independent claim 193 as currently amended, and these differences between claim 193 and the combined teachings of the cited references would

not have been obvious to one of ordinary skill in the art at the time the invention was made.

Each of Paper No. 1 and Strong et al. teaches a drilling assembly that includes a casing bit. Brown et al. teaches removing portions of a sidewall of a casing string using explosives or chemicals. *Brown*, column 2, lines 36-44. Applicants respectfully assert that, at best, it would have been obvious to one of ordinary skill in the art at the time the present invention was made to place a casing section in a well bore using a casing bit as taught by Paper No. 1 or Strong et al., and to subsequently remove a portion of a sidewall of the casing section using explosives or chemicals, as taught by Brown. There is no teaching or suggestion whatsoever in Brown, Paper No. 1, or Strong et al. that explosives or chemicals may be used to render a drill bit more drillable. Furthermore, there is no teaching or suggestion whatsoever in Brown, Paper No. 1, or Strong et al. that explosives or chemicals may be provided in a container affixed within a drill bit or a casing section, as recited in claim 193, as presented herein.

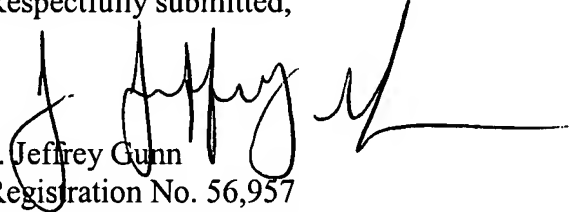
As Paper No. 1, Strong et al., and Brown, when combined, do not describe, teach, or suggest all the limitations of claim 193, Applicants respectfully assert that the differences between the invention of claim 193 and the combined teachings of the cited prior art references would not have been obvious to a person of ordinary skill in the art at the time the invention was made, and request that the Examiner withdraw the rejection of independent claim 193 under 35 U.S.C. § 103(a).



**CONCLUSION**

Claims 1 through 9, 11 through 74, 179 through 186, and 189 through 193 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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